ATOMIC ENERGY newsletter

THE FIRST AND ONLY ATOMIC [illegible] SERVICE

ROBERT M. SHERMAN, EDITOR. PUBLISHED BI-WEEKLY BY ATOMIC ENERGY NEWS, INC., 509 FIFTH AVENUE, NEW YORK 17, N. Y.

April 8th, 1952
Vol. 7...No. 4

Dear Sir:

The new series of tests of nuclear explosives was initiated last week with the first detonations at the USAEC's Nevada Proving Ground, near Las Vegas. In this first explosion, of the third series of such tests here, the critical elements were dropped from an Air Force plane, and the explosion occurred close to the ground. The test organization is headed by Carrol L. Tyler, manager of the USAEC's Santa Fe Operations Office, Albuquerque, N.M., and draws its participating personnel from the Los Alamos Scientific Laboratory; Sandia Laboratory, Albuquerque; various units of the armed forces and technicians and specialists from the USAEC's national laboratories, industrial and research organizations, and other governmental agencies. As at previous tests, there may be some off-site radiation above normal levels. Cloud tracking and sampling over the area by the Air Force will supplement the monitoring of the about 100 U.S. Weather Stations that will follow this radioactivity.

The seat of the long-contemplated nuclear research laboratory to be established by UNESCO has been chosen to be Geneva, Switzerland. However, actual construction will probably not start for another two years. Its purpose will be research in pure science without military implications. At the recent UNESCO conference in Geneva, full agreement was reached to set up a Council of Representatives of European States for planning the international laboratory and organizing other forms of cooperation in nuclear research. The Netherlands, Germany and Yugoslavia signed definite commitments; France, Denmark, Italy, Greece, Sweden, and Switzerland gave accord subject to ratification by their parliaments; and Norway and Belgium are expected to sign later. The Council will operate on funds granted by the participating states, with amounts already subscribed by certain of the states. It is expected that the laboratory will be equipped with a 5 Mev cyclotron, and a cosmotron of 3 to 10 Bev.

Sir John Cockcroft, head of Britain's Atomic Energy Research Establishment, Harwell, has just concluded more than 2 weeks of discussion with officials of the USAEC, in Washington. Main objectives are to enlarge the exchange of classified information on nuclear subjects, between Britain and America.

Details of one of the early isotope separation experiments, based on the so-called "isotron" separator, have now been declassified by the USAEC. The "isotron" isotope separator was developed at Princeton University in 1941-2 during intensive scientific investigation of electromagnetic methods of separating uranium-235 from uranium-238. It is a machine which may be used either to separate isotopes, or, as a mass spectrometer, for measuring masses of ions, using the "time of flight" principle. The project was abandoned in February 1943 because other methods of producing U-235 showed more promise. However, the method may be valuable in other types of nuclear physics research, having no connection with separating uranium isotopes.

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BUSINESS BRIEFS...in the nuclear energy field...

EXPANSION PRESAGED- Larger participation in nuclear energy projects is envisaged by Electric Boat Co., Groton, Conn., according to that firm's annual report, released last week. Presently, Electric Boat is engaged in the construction of a hull for a nuclear reactor powered submarine, under a Navy Bureau of Ships contract. Now, Electric Boat has formed General Atomic Corp. The firm anticipates that this corporation will be activated either as a subsidiary or a division in the future for research and development in the field of industrial applications of atomic energy and nuclear fission. John Jay Hopkins, Electric Boat chairman and president, pointed out that "it is hoped that the company's introduction into this new and limitless field, through the construction of the atomic submarine on which it is now engaged, will eventually evolve into a major division of the enterprise involving profitable commercial uses of this new type of energy". (Electric Boat earned $3,872,293 in 1951, a 177% gain on the 1950 net income, a reflection of the large share of defense business it has obtained.)

NEW PLANT CONSIDERED- Now being considered for a new plant by the U.S. Atomic Energy Commission is an area in Jefferson County, Ky., northeast of Louisville. However, industrial and commercial groups are protesting. They feel that the large quantities of electric energy such a plant would require would create shortages. Further, they fear loss of skilled labor, now so difficult to replace.

CIVIL DEFENSE- After an 18-month program by the Federal Civil Defense Administration to educate American industry to the need for instituting protective programs, the Administration reports that the efforts generally have been unsuccessful. As a result, if an atomic war started, the effect on the nation's industry and war effort would be little short of disastrous. The administration feels that until some real effort is made to translate planning into action, the situation will remain very dangerous.

ADDITIONAL FUNDS TO BE REQUESTED- The U.S. Atomic Energy Commission will shortly request funds for its planned $5 million expansion, Gordon Dean, USAEC Chairman, told a meeting of the New York Safety Council in New York last week. Dean said Congress would be asked for monies to enlarge the atomic program, which would result in "perhaps the largest construction task yet to be handled by the American building industry."

CANADIAN NUCLEAR OPERATIONS- The new Canadian government-owned and controlled company, Atomic Energy of Canada, Ltd. (this LETTER, 3/25/52, p.1) which has taken over Chalk River, has been given an authorized capital of 75,000 shares of no par value. Speaking in the House of Commons in Canada recently, Canadian Trade Minister Howe stated: "It is becoming increasingly evident that the Chalk River atomic energy establishment has commercial possibilities and that the earnings from this operation will be substantial." He pointed out that developments in the past year had indicated that large scale industrial application of atomic energy is closer than had been expected.

C. J. Mackenzie, president of the National Research Council of Canada and continuing president of the Atomic Energy Control Board, has been made president of Atomic Energy of Canada, Ltd. He is resigning from NRC. Operation of Chalk River, which was taken over April 1st by the new company, will, as heretofore, continue to be in accordance with the policies of the Atomic Energy Control Board.

Atomic energy research was started in Canada in 1944 when the National Research Council arranged for the required facilities by taking over laboratories in the University of Montreal and securing the necessary staff and equipment. British, French, and American scientists cooperated in the venture. Building of pile facilities was undertaken at Chalk River, and living accommodation was provided for the staff in a model village, six miles away, at Deep River, Ont. During construction stages, at Chalk River, management of the project was in a Crown company, Defense Industries, Ltd., but in 1947 the entire enterprise was placed under the direction of the National Research Council. Early this year Trade Minister Howe announced Canada would soon build a new, larger, and more efficient pile at an estimated cost of $30 million. First plans were to proceed with construction under the present management whereby the National Research Council operates the project as one of its main divisions. However, it was subsequently decided that the wiser procedure would be to create new machinery now for industrial operation.

RADIOISOTOPES...applications & notes...

MEDICAL APPLICATIONS- The potential uses of atomic energy for medical purposes may prove to be of greater importance to humanity, as well as of greater benefit, than its use as a source of power, Glenn T. Seaborg recently told a reporter at an American Chemical meeting in Buffalo recently. Dr. Seaborg, co-discoverer of plutonium and four other transuranium elements, mentioned the three fields where radioisotopes find use in medicine: as diagnostic tools, as tracers, and as therapeutic agents. For diagnostic purposes, radioactive materials will find use in the understanding of circulatory disorders, he said. If there are anomalies in the circulatory system, the radioactive substances, such as sodium, do not go to all parts of the body, he pointed out. Thus, the tumor can be localized by the use of such material, in certain types of brain tumors. For tracing purposes, where it is desired to follow the course of a medication or a food that it taken into the body, radioisotopes are already finding wide employment, and new horizons are constantly opening, he stated. For therapeutic work, the potentialities are still hardly tapped, Dr. Seaborg explained. He mentioned radioactive cobalt, used in place of radium. Here it is a more abundant, and hence less expensive source of gamma rays. In certain types of dermatological conditions, such as some types of skin cancer, radioisotopes have already proved useful, as they also have in some blood diseases, Dr. Seaborg observed.

NORWAY HOSPITAL- One example of radioactive cobalt replacing radium has occurred in Norway. The physical laboratory at Norway's largest general hospital in Oslo (Rikshospitalet) has replaced its radium, used in cancer treatment, with radiocobalt from the Norwegian-Dutch uranium reactor at Kjeller. Of interest is that the gamma emission will be equal to 10 grams of radium costing over $210,000, yet the cobalt charge will cost only about $280. Since the life of the cobalt is three to five years, Rikshospitalet has two cobalt sources; one in the laboratory, and the other being reactivated at the Kjeller plant. (Meanwhile, the hospitals betatron is now scheduled for completion by July 1. The 31-million electron volt apparatus was designed by Norwegian engineer Rolf Wideroe, and is being built by the Swiss firm of Brown-Boveri in Baden, Germany. The new betatron will for the first time provide Norwegian radiologists with an instrument for treatment of deep-seated cancer.)

NEW PRODUCTS, PROCESSES & INSTRUMENTS...in the nuclear field...

FROM THE MANUFACTURERS- Newly designed wide range beta-gamma survey meter, Model 2585, is based on the principle of the Oak Ridge-designed "cutie pie". However, this new model 2585 is said to offer many unique features which eliminate the disadvantages of the older "cutie pie". Model 2585 is so designed that it can be set upright for continuous monitoring. It is light in weight (3-lbs.) with the circuit and battery housing ahead of and close to the fingers, instead of being balanced above the handle. The five position switch, providing zero setting and three ranges up to 5,000 mr/hr, is located at the top of the pistol-grip handle to allow simple one-hand operation of the instrument. Zero adjust and calibration controls are on the top of the instrument, and ahead of the meter, which slopes toward the user, to permit easy reading.

New scintillation detector, Model P-20, said to feature extremely high gamma efficiency when used with the proper crystals, as well as to have a long plateau and negligible tube noise. Since it is supplied with its own amplifier, it may be operated with most commercially available scalers, manufacturer states. For medical work the P-20 is equipped with a two inch long directional lead shield and two Thallium activated Sodium Iodide crystals of different diameters. The directional shield has an inner cylinder which is used with the smaller crystal, but which is removed when the larger crystal is inserted. This simplifies the compromise between efficiency and directional sensitivity in that it permits a choice of two combinations depending on the requirements of the particular measurement. For radioassay work, the detector is available with one of two alternate crystal arrangements, depending on the radiation to be measured. For gamma assay, the detector is supplied with a thallium activated sodium iodide crystal surrounded by a flush mounted lead shield. For beta assay work, instead of sodium iodide, stilbene is used as the phosphor.

ATOMIC PATENT DIGEST...latest U. S. grants & applications...

Neutron detector. In part, a neutron responsive device comprising a sealed tubularly shaped glass envelope, containing an ionizable gas and a pair of spaced electrodes, one of these electrodes having a pointed inner end and the other of the electrodes having a rounded inner end, and a coating of a material which emits alpha particles upon neutron irradiation thereof applied to the inner surface of this tubular envelope. U. S. Pat. No. 2,588,789 issued March 11, 1952; assigned to United States of America (USAEC).

Boron chloride production from an alloy of boron with tantalum. In part, a method for recovering the boron from an alloy of boron with tantalum which comprises treating the alloy with chlorine at a temperature between 575 deg. C. and 900 deg. C., condensing the resulting tantalum chloride and maintaining the resulting boron chlorine in a gaseous phase to produce a polyphase system, separating the gaseous phase containing boron chloride from the polyphase system, and isolating boron chloride from the separated phase. U. S. Pat. No. 2,589,391 issued March 18, 1952; assigned to United States of America (USAEC).

Half-life determining method. In part, the steps of detecting the individual quantum of radiation of a radioactive sample as a first pulsating electrical signal, producing a second electrical signal of predeterminable duration and giving individual electrical pulses corresponding to the pulsations of the first electrical signal, and of a magnitude proportional to the pulse interval of the corresponding pulsations of the first electrical signal, and counting the number of pulses in the first and second signals, whereby the half-life of the radioactive sample may be calculated therefrom. U. S. Pat. No. 2,590,057 issued March 18, 1952; assigned to United States of America (USAEC).

Process for photochemical chlorination of hydrocarbons. In part, the process for photochemical chlorination of heptane to approximately eighty per cent chlorine which comprises bringing the heptane, under actinic light, in contact with chlorine diluted with approximately an equal volume of an inert gas at a temperature rising gradually from about 25 deg. C. to about 50 deg. C. for approximately 48-hours, then in contact with undiluted chlorine for a further period of approximately 80-hours at a temperature rising gradually to approximately 150 deg. C. U. S. Pat. No. 2,590,426 issued March 25, 1952; assigned to United States of America (USAEC).

Oscillator controlled relay circuit. In part, an electrical control circuit which is operable to effect the repetitive energization of equipment associated therewith for very short intervals of time. U. S. Pat. No. 2,590,826 issued March 25, 1952; assigned to United States of America (USAEC).

Noise reducer in scintillation counting. In part, comprises a crystal excitable by exterior radiation for generating corresponding flashes of light, a plurality of translating paths for said flashes of light, each path comprising a face of said crystal, and photoelectric means associated therewith to provide a similar plurality of sources of electrical pulses, and means for combining the outputs of all of said photoelectric means to produce an output pulse signal for each light flash and effectively to inhibit an output signal generated by noise. U. S. Pat. No. 2,590,867 issued April 1, 1952; assigned to United States of America (Secretary of the Army).

Multiple element radioactive ray recording. In a method of investigating radioactivity in a bore hole drilled into the earth, in part, the steps of simultaneously lowering into the bore hole several radiation responsive devices having different radiation response characteristics, exposing these devices to radioactivity in the bore hole so as to cause at least one of these devices to respond significantly, and thereby obtaining information about radioactive conditions in the borehole by comparing the indications of the responses of these devices. U. S. Pat. No. 2,590,874 issued April 1, 1952; assigned to Schlumberger Well Surveying Corp., Houston, Texas.

Proportional counter. In combination with a proportional counter employing as a filling gas a mixture of a polyatomic gas with not more than 95% by volume of a noble gas, an amplifying system comprising at least one electric discharge device having an anode, a control grid, and a cathode, with associated circuits. U. S. Pat. No. 2,590,925 issued April 1, 1952; assigned to United States of America (USAEC).

RAW MATERIALS...radioactive mineral finds & workings...

UNITED STATES- Wyoming: A potential source of uranium minerals in a new area was revealed recently when the USAEC withdrew 65,000 acreas of public lands in northeastern Wyoming for exploration purposes. This action confirmed reports of several years standing that valuable new deposits of uranium had been discovered by prospectors in the area. The search was touched off, the USAEC stated, by the discovery last October of carnotite-like uranium minerals by a member of the U. S. Geological Survey. The area to be explored comprises 102 sections in Campbell and Johnson counties. Lands found to contain significant unaniferous deposits will be made available for private development under lease arrangements with the USAEC. Colorado: Three projects have recently come to the forefront in the Colorado Front Range, and are attracting some interest. At the Copper King mine, north of Fort Collins, shaft sinking is progressing toward the 150-ft. level. Reportedly, vein structure and uranium content on the 100-ft. level are encouraging, but miners have more work ahead before they can establish production possibilities. In the old Quartz Hill area near Central City, Colo., the Calhoun shaft has been unwatered to the 600-ft. level. Plans are to eventually crosscut toward the Wood mine, where the vein structure and uranium content will be checked. At Haputa ranch, near Canon City, Colo., USGS drilling has disclosed persistent radioactivity, but how much is due to uranium, and how much to thorium, remains to be seen.....Utah: The Bullion Monarch Mining Co. has speeded development at its uranium mine in the Marysville district, according to an official of that firm. Present efforts are directed to outline the uranium ore found in a vein some 200-feet below the surface, and north of the company's large open-pit mine. The vein was located by diamond drilling several months ago, but it was necessary to sink a 60-ft. winze from the adit below the open pit, and crosscut from the winze to reach the vein.

AUSTRALIA- Australia has now reached an agreement with the United States and Britain concerning the "full and early" development of newly discovered uranium deposits at Radium Hill in the State of South Australia, according to Australian Prime Minister Robert Menzies.

SOUTH AFRICA- Under the program jointly sponsored by the United States and Britain, by which uranium is being recovered from the gold tailings of the Union's gold mines, production of uranium is expected to start next month, according to J. H. Viljoen, Minister of Mines here. Up to the end of last year, expenditure on the uranium extraction plant totaled about $1,680,000 which was obtained from loan funds granted by the South African Atomic Energy Board. Originally, as was announced in December, 1950, West Rand Consolidated, Daggafontein Mines, Blyvooritzicht Mines, and Western Reefs Exploration were to be engaged in uranium extraction. Since then, Stilfontein and West Drifontein have been added to the list. Others likely to enter uranium production are Randfontein Estates, and possibly Luippaards Vlei. Another change, too, has occurred since the original agreement, namely, in the return the mines will get on their uranium. The price of the uranium is now to be figured on a cost-plus basis, thus ensuring a higher price than was contemplated in the original agreement. Considerable optimism has been shown by Mr. Viljoen, the Mines Minister, who said that plans were underway for a dozen other gold mines to enter the uranium recovery program in a short time.

NEW BOOKS & OTHER PUBLICATIONS...on nuclear subjects...

United States Civil Defense, Shelter from Atomic Attack in Existing Buildings; Part 1, Method for Determining Shelter Needs and Shelter Areas. Includes instructions, forms and recommendations for use of civil defense directors, survey teams, and their supervisors, and technically qualified personnel in conducting a shelter survey. 53 pages.--Superintendent of Documents, Washington 25, D.C. (20¢)

Radiological Health and Civil Defense. Bulletin Series No. 48, U. of Florida. Comprises proceedings of a program for public health personnel and practicing physicians interested in radiological health and medical applications of radiations and radioactivity.-- Director, Florida Engineering and Industrial Experiment Station, Gainesville, Fla.

Sincerely,

The Staff,
ATOMIC ENERGY NEWSLETTER

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